

METHOD FOR FABRICATING OXIDE THIN FILMS

ABSTRACT OF THE INVENTION

A method for fabricating a thin film oxide is provided. The

5 method includes: forming a substrate; treating the substrate at temperatures equal to and less than 360° C using a high density (HD) plasma source; and forming an M oxide layer overlying the substrate where M is an element selected from a group including elements chemically defined as a solid and having an oxidation state in a range of

10 +2 to +5. In some aspects, the method uses an inductively coupled plasma (ICP) source. In some aspects the ICP source is used to plasma oxidize the substrate. In other aspects, HD plasma enhanced chemical vapor deposition is used to deposit the M oxide layer on the substrate. In some aspects of the method, M is silicon and a silicon layer and an oxide layer

15 are incorporated into a TFT.